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Estimation of Secchi Depth from Turbidity Data in the Willamette River at Portland, OR (14211720)

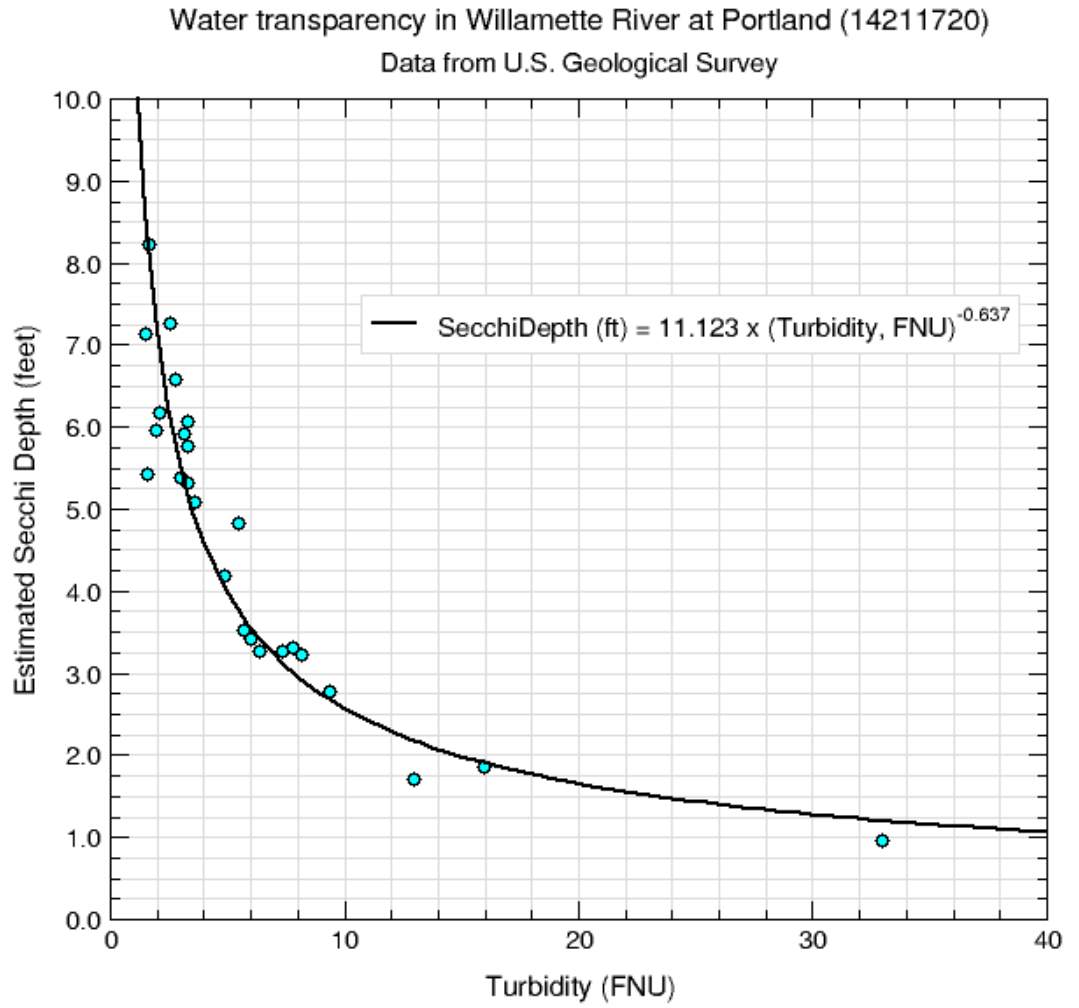
Secchi depth (pronounced seckky) is a measure of water transparency, where transparency increases with increasing secchi depth. The [secchi depth](#) is the depth of water beyond which a high-contrast pattern on a submerged disk is no longer visible.

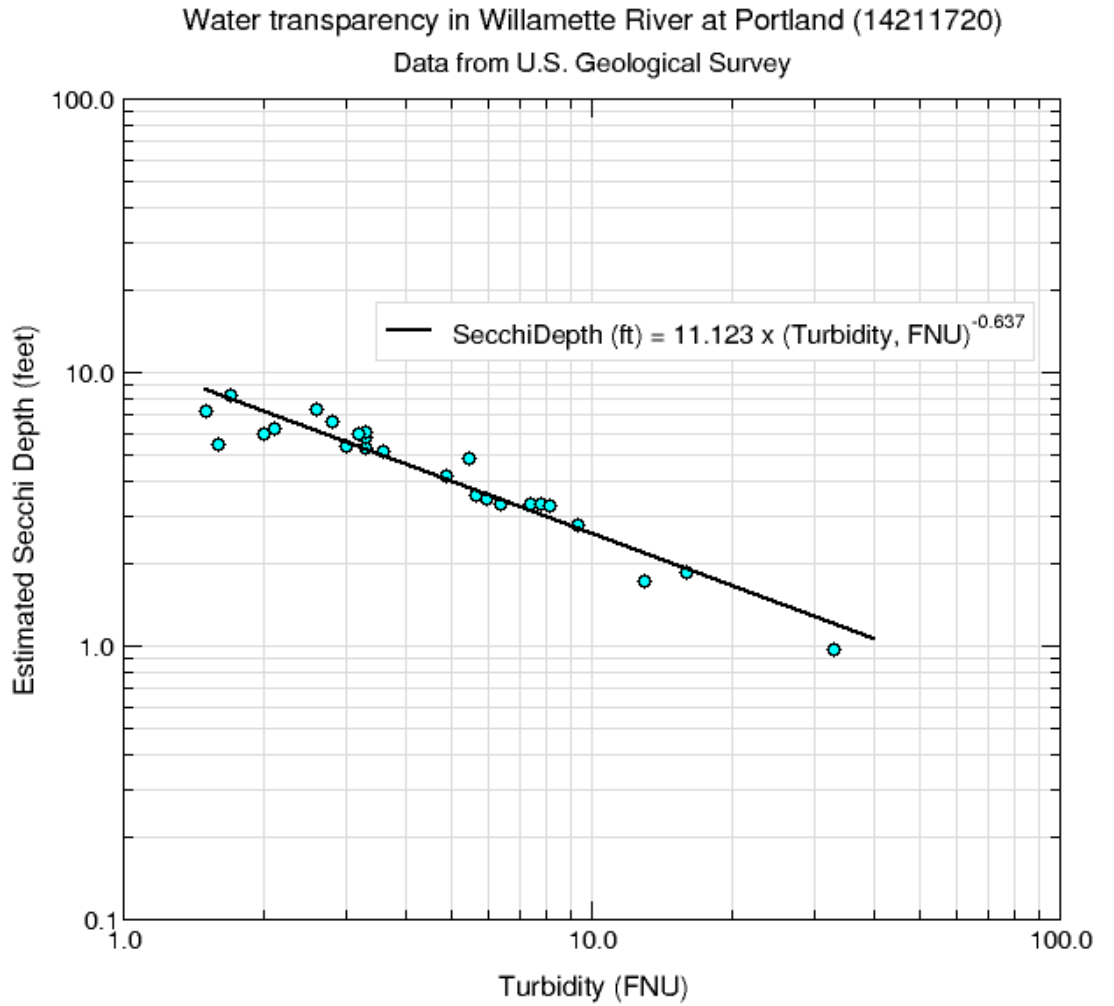
Secchi depth (feet) can be estimated on the basis of measured turbidity data. For the Willamette River at Portland site (14211720) located at the Morrison Bridge in downtown Portland, OR, turbidity data are collected every half hour. Measurements of the secchi depth near the monitor location have been used to create a regression model of secchi depth as a function of turbidity:

$$\text{Secchi Depth} = 11.123 \times \text{Tbdy}^{(-0.637)}$$

where Secchi Depth is in feet, Tbdy is turbidity in [FNU](#), the "x" is the symbol for multiplication, and the "^" is the symbol for exponentiation. This equation includes a bias correction factor of 1.01. The regression model was developed in accordance with the methods set forth in USGS Techniques and Methods, book 3, chapter C4 (see <http://pubs.usgs.gov/tm/tm3c4/>), using the [spreadsheet](#) that was developed originally to construct models of suspended sediment concentration (SSC) as a function of turbidity. In this case, estimated secchi depth was substituted for SSC in the spreadsheet to construct the model.

Twenty-five pairs of secchi depth and turbidity measurements in the Willamette River at Portland from October 2012 through January 2014 were used to construct this model. The following graphs show the data used to create this model:

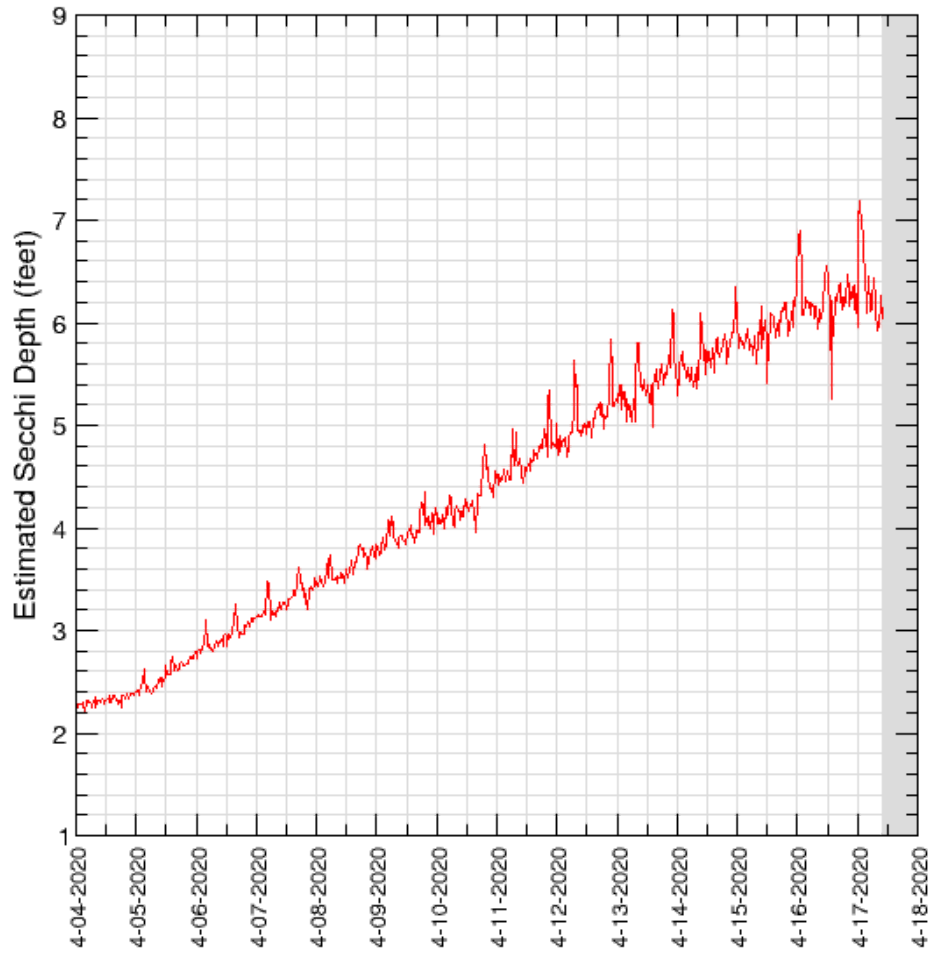




The real-time estimated secchi depth data based on measured turbidity data that result from this model are shown in the graph below:

Estimated Secchi Depth at Willamette River at Portland, OR (14211720)

Provisional Data - Subject to Revision



[U.S. Department of the Interior | U.S. Geological Survey](https://or.water.usgs.gov/will_morrison/secchi_depth_model.html)
URL: https://or.water.usgs.gov/will_morrison/secchi_depth_model.html
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